

REMARKS

Claims 1-228 are pending in the present application.

Claims 226-228 are newly entered claims specifying the thickness of the phosphor layer. Support for the claims is provided on pages 15, 34, 36, 38 and 41.

Claim 1 is amended to specifically recite that the phosphor or scintillator layer is deposited in successive steps. Support for the amendment is provided in the descriptions of Figs. 5, 6, 7 and 11.

No new matter is entered as a result of the amendments.

CLAIM REJECTIONS – 35 USC § 112

Claims 17-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite.

Claims 17-20 are amended there rendering the rejection moot.

CLAIM REJECTIONS – 35 USC § 102

Claims 1-16, 29-45, 62-89, 122-129 and 130-133 are rejected under 35 U.S.C. 102(b) as being anticipated by GB 2339800 (GB'800).

Claim 1 has been amended to specifically recite that the phosphor or scintillator layer is deposited onto the substrate in successive steps. Claims 2-16, 29-45, 62-89, 122-129 and 130-133 ultimately depend from claim 1 and have the same limitation by dependence.

GB'800 is specific to a technique for forming media for use in a hologram. To function as intended ZnS is deposited in a single pass to achieve a coating thickness of only 500-600 Å corresponding to the wavelength of visible radiation. If a thicker coating is applied the device would not function as intended.

The present invention is specific to a method of coating a phosphor or scintillator layer for use in medical imaging. In order for a phosphor or scintillator layer to be functional the phosphor layer must be sufficiently thick to capture radiation (typically x-radiation), and to provide a sufficient signal for detection. One of skill in the art realizes that a layer sufficient to

reflect visible light in a hologram and one sufficient to function as a radiation converter are not related.

It is well known in the art that creating a layer with minimal defects and a thickness sufficient to act as a phosphor or scintillator is very difficult. Achieving such a coating has been the subject of much research and still an adequate solution was lacking prior to the present invention. The present application mitigates problems typically encountered in the art.

One claimed aspect of the invention is the use of multiple deposition passes which provides a thick layer of high quality. This step is not taught in GB'800 and therefore the rejection under 35 U.S.C. 102(b) is improper. Furthermore, multiple deposition passes is contrary to the teachings of GB'800 since this would necessarily form a layer thickness which is nonfunctional for the intended application.

The rejection of claims 1-16, 29-45, 62-89, 122-129 and 130-133 under 35 U.S.C. 102(b) as being anticipated by GB 2339800 (GB'800) is improper due to the failure of the cited reference to teach, at least, deposition with successive passes. Furthermore, deposition by successive passes is contrary to the teachings in GB'800. The rejection is rendered moot by amendment.

CLAIM REJECTIONS – 35 USC § 103

Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB'800. Claims 17-20 ultimately depend from claim 1. As set forth above claim 1 has been amended to recite that the deposition is done in successive steps due to the necessity for forming thicker layers. GB'800 is specific to very thin, 500-600 Å layers formed in a single pass. The use of multiple deposition steps is contrary to the teachings of GB'800. The layer thickness obtained by multiple layers would render the device useless for the intended purpose.

GB'800 teaches against the claimed invention thereby rendering the rejection of claims 17-20 under 35 U.S.C. 103(a) as being unpatentable over GB'800 improper. The rejection is traversed.

Claims 130-146 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB'800 in view of EP 1113458 (EP'458).

Claims 130-146 ultimately depend from claim 1. GB'800 as applied to claim 1 is discussed above and all comments are equally applicable here. In summary, GB'800 teaches a film for use in a holography application wherein the thickness is on the order of 500-600 Å. The presently claimed invention is specific to a phosphor or scintillator layer deposited with successive steps which provides a thicker layer.

EP'458 is specific to a phosphor layer. For the reasons set forth above GB'800 and EP'458 are incompatible teachings, particularly, with regards to the layer thicknesses and application of the eventual product. If one of skill in the art attempted to combine these references they would either obtain a holographic material with CsBr:Eu phosphor wherein the coating thickness of the phosphor is insufficient to act as an intensifying screen or they would obtain an intensifying which would not act as a holographic layer. One of skill in the art could not apply the teachings of one to the other without destroying the function thereof.

Even if one did combine the references, which can only be based on hindsight reconstruction, they would have no suggestion or motivation for deposition in successive steps as set forth in the instant claims. Neither reference suggests deposition in successive steps. GB'800 teaches against deposition in successive steps. The references taken together fails to recite a critical element of the claimed invention.

The rejection of claims 130-146 under 35 U.S.C. 103(a) as being unpatentable over GB'800 in view of EP 1113458 (EP'458) is traversed.

Claims 90-122 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB'800 in view of EP'458 and further in view of US Patent 4,455,323 (US'323).

Claims 90-122 ultimately depend from claim 1. The combination of GB'800 and EP'458 as related to claim 1 is discussed above and all comments are relevant herein. In summary, GB'800 fails to teach deposition of phosphor in successive steps and teaches against such a technique due to the expected failure of the eventual device for the desired application.

EP'458 teaches a specific phosphor but fails to mitigate the deficiencies of GB'800 as a reference.

The Office notes that the combination of GB'800 and EP'458 also fail to disclose a support of aluminum with a coating as claimed. Applicants agree.

US'323 is cited as disclosing a polymer subbing layer on aluminum to improve adhesion. US'323 is specific to a wet coating technique wherein the phosphor is coated as a dispersion. The dispersion is then dried and the coating is cross-linked to the subbing layer. Applicants are at a loss to understand how a wet coating technique would lead one of skill in the art to apply a phosphor by vapor phase techniques in successive steps. Even in hindsight US'323 fails to mitigate the deficiencies of the primary references and it is directed to non-analogous art.

The rejection of claims 90-122 under 35 U.S.C. 103(a) as being unpatentable over GB'800 in view of EP'458 and further in view of US Patent 4,455,323 (US'323) is traversed.

Claims 146-169 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB'800 in view of EP'458 and further in view of US Patent 4,741,993 (US'993).

Claims 146-169 ultimately depend from claim 1. The combination of GB'800 and EP'458 as related to claim 1 is discussed above and all comments are relevant herein. In summary, GB'800 fails to teach deposition of phosphor in successive steps and teaches against such a technique due to the expected failure of the eventual device for the desired application. EP'458 teaches a specific phosphor but fails to mitigate the deficiencies of GB'800 as a reference.

The Office notes that the primary references fail to teach the application of a protective coating over the phosphor layer. Applicants agree.

US'993 is cited as disclosing the protective layer. Even with this teaching US'993 still fails to mitigate the deficiency of the primary references. More specifically, US'993 fails to provide any suggestion of phosphor deposition using successive steps. Therefore, the combination of references would not lead one of skill in the art to the claimed invention.

The rejection of claims 146-169 under 35 U.S.C. 103(a) as being unpatentable over GB'800 in view of EP'458 and further in view of US Patent 4,741,993 (US'993) is traversed.

Claims 46-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB'800 in view of EP'458 in view of EP'364 or US'993 and further in view of US Patent 5,460,853 (US'853).

Claims 46-61 ultimately depend from claim 1. The combination of GB'800, EP'458, EP'364 and US'993 has been discussed above and all comments are applicable herein. In summary, the primary references fail to recite, suggest, or lead one of skill in the art towards deposition in successive steps.

The Office notes that the primary references also fail to recite successive forward and backward motion to deposit layers. Applicants agree and add that GB'800 teaches against such a motion since the build up of material would exceed that which is considered suitable for the intended application.

US'853 is cited as teaching forward and backward motion. Applicants disagree.

US'853 actually teaches against a forward and backward motion as set forth in col. 3 lines 42-54. Specifically stated therein is the desire to deposit material "with a minimal number of passes, preferably one" thereby avoiding the problems associated with stopping and reversing the web direction.

The primary references fail to recite successive forward and backward motion and US'853 teaches against it. Against this backdrop the Office now assumes it would be obvious to do that which the art teaches to avoid. One of skill in the art would avoid the hindsight combination relied on by the Office due to, at least, the contrary teachings contained therein.

The rejection of claims 46-61 under 35 U.S.C. 103(a) as being unpatentable over GB'800 in view of EP'458 in view of EP'364 or US'993 and further in view of US Patent 5,460,853 (US'853) is traversed.

Claims 170-209 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB'800 in view of EP'458 in view of EP'364 or US'993 and further in view of US Patent 4,983,848 (US'848).

The combination of GB'800, EP'458, EP'364 and US'993 is discussed above. In addition to the aforementioned deficiencies the Office notes that the primary references fail to recite lamination onto a carrier layer and further fails to recite lamination in a vacuum chamber or outside. US'848 is cited for those teachings which are otherwise lacking.

Even with US'848 there is no teaching which would lead one of skill in the art to consider deposition in successive steps. Furthermore, the art of record teaches against such a step. US'848 fails to mitigate the deficiency in the art.

The rejection of claims 170-209 under 35 U.S.C. 103(a) as being unpatentable over GB'800 in view of EP'458 in view of EP'364 or US'993 and further in view of US Patent 4,983,848 (US'848) is traversed for, at least, the reasons set forth above.

DOUBLE PATENTING

Claims 1-45 and 62-225 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-75 of U.S. Patent No. 7,141,135.

A Terminal Disclaimer is filed therewith thereby rendering the rejection moot.

CONCLUSIONS

Claims 1-228 are pending in the present application. All claims are believed to be in condition for allowance for the reasons set forth herein.

Respectfully submitted,


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